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ABSTRACT

A model was developed at Arizona State University (ASU) to simulate the effect of President Reagan's proposed 1983 cuts in student financial aid in terms of programs and student credit hour load. The model allows administrators to simulate the impact on various student groups. The analysis involved 3,141 full-time undergraduates with financial aid program packages. Students were aggregated into the following groups: students with less than 20 percent loss in aid, students with an aid loss of 20-29 percent, and students with a 30 percent or higher loss. It was assumed that students with 30 percent or more loss would terminate enrollment, while the middle group would be at risk, and the group with less than 20 percent aid loss would probably survive. It was found that 12.5 percent of the study population would probably not continue at the university, 21.4 percent would be at risk, and 66.1 would probably continue. The Reagan proposal seems to affect minority groups unevenly at ASU. More Asian Pacific, Hispanic, and Black students were identified as at risk than were American Native and White students. In addition, more resident students were at risk. Programs and student credit hours in liberal arts, business, engineering, and education were most affected by the proposed cuts. (SW)

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A Model Simulating the Impact of Reagan's Student Financial Aid Proposals on the Institution

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D. R. Coleman, Chairman
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Abstract

The Reagan Administration's proposal to reduce funding for student financial aid programs would have significantly impacted postsecondary institutions. The major question facing these institutions is determining where the impact will be. This paper describes a model developed at Arizona State University to simulate the effect of Reagan's cuts in student aid in terms of programs and SCH load at the college level. The model allows administrators to simulate the impact on various student groups. This provides management with a useful tool to identify the colleges and student groups that probably will be hardest hit by the proposed plan.

A Model Simulating the Impact of Reagan's Student Financial Aid Proposals on the Institution

Introduction

President Reagan's original FY83 budget proposed massive cuts in federal student financial aid programs. It was estimated that in FY84 institutions would receive 50 percent fewer federal student dollars than in FY82 (NACUBO Business Officer, March 1982). Although Reagan's proposals did not pass Congress, funding reductions of the magnitude proposed would have had a severe impact on higher education. It certainly places higher education on "notice" that the federal commitment to student assistance is not without its limits.

Purpose

During 1982, Arizona State University (ASU) was in the process of developing a computerized financial aid system. Parts of this system were designed to enable management to model changes in student financial aid based on changing federal regulations and funding. However, at the time President Reagar announced his financial aid proposals, the new system was not operational. The purpose of this paper is to describe a model developed to provide management with a timely estimate of the impact of the Reagan proposals, until the new system becomes operational.

Institutions without strong systems support may find the approach taken at ASU helpful because the analytical approach does not involve sophisticated modeling capability.

The Model Design

The basic concept of the model is to apply Reagan's FY83 financial aids proposal to undergraduate students that received financial aid during Fall Semester 1980.[1] For each student, the model identifies and reduces aid programs in accordance with the Reagan proposal, establishing a new level of total aid for that student. Students were grouped by the magnitude of their reduction as a percentage of the estimated funds needed to attend ASU. Student identification numbers were used to link student financial aid data with the student master file and course file, thus allowing additional analysis of student groups with various levels of financial loss.

Data Characteristics of Students Receiving Financial Aid

During the 18-month aid cycle for Fiscal 1980-81, 12,178 undergraduate students received some form of financial aid at Arizona State University. These students can be divided into two groups:

1. Students with formal need analysis which results in the establishment of a student budget and a package of financial aid programs to meet that budget (3,141 full-time and 160 part-time students for Fall Semester 1980).

2. Students without a formal need analysis. These students received aid from discretionary programs (8,044 full-time and 833 part-time students for Fall Semester 1980).

This analysis concerns the 3,141 full-time undergraduate students with financial aid program packages. The information required in the simulation was available for these students. Their financial aid records contained:

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[1] Fall Semester 1980 was used for demonstration purposes because this data was available on a computer file. During 1982, ASU was in the process of developing a new financial aid system. The original intent was to utilize Fall Semester 1982 data for the simulation, however, at the time this data was not on the computer. When the Reagan plan was defeated in Congress, the impetus to computerize the Fall 1982 data was lost. The financial aid system will be fully operational for FY83-84.

Budget	Estimated funds necessary to attend ASU.
Contribution	Funds available from personal and parental contributions to meet budget.
Discretionary Funds	Funds distributed at the discretion of the institution to meet the student's budget. These would include:

Cash Awards
Room and Board Allowances
Tuition Aid
Book Allowances
Work/Study Funds
Supplemental Grants (SEOG)
National Direct Student Loan Funds (NDSL)

Entitlement Funds	Funds available to the student from Federal Programs. These include:

Social Security Educational Benefits
Veteran's Education Benefits
State Incentive Grants (SSIG)
Pell Grants
Self-Help Funds
Guaranteed Student Loans (GSL)

Reagan's Proposal

The simulation algorithm was based on President Reagan's FY83 financial aid proposal as announced in the Chronicle, January 12, 1983. Each program providing aid to a student was individually reduced to the proposed level. Supplemental grants (SEOG) and State Student Incentive Grants (SSIG) were eliminated in the Reagan proposals. Both these cuts were 100 percent. National Direct Student Loans (NDSL) were also eliminated. However, at Arizona State University the NDSL repayment level currently is self-supporting. Therefore, in this simulation there was no change in the level of NDSL funding.

College Work Study (CWS) was cut approximately 25 percent, and Graduate Student Loans (GSL) 19 percent. Because the mechanism for making these reductions was not clear in the proposals, these reductions were applied to each student individually.

The Pell appropriation was cut approximately 40 percent in the Reagan proposal. These reductions were proposed so as to maintain aid to those students with the highest level of need, while reducing aid to those students with lower levels of need. Reagan's proposal also supported the previous scheduled increase in the maximum Pell grant a student could receive in FY83 to $2,300 (Federal Register, Vol. 45, No. 251, December 1980). However, for purposes of the simulation, the maximum Pell Grant was left at the FY80-81 level of $1,750. This was done because the budget computations in the financial aid files were based on FY80-81 costs to attend ASU.

The simulation calculated the proposed Pell Grant based on the following formula:

($1,750 - Contribution) X Percentage Factor = New Pell Grant

The percentage factor is determined by the Pell Need index. This index is used to rank students based on their need for aid. The greater the level of need, the lower the Pell index and the higher the percentage factor. Figure 1 presents the percentage factors used in the simulation.

Figure 1

Percentage of Full Pell Grant Funded by Pell Index

Pell Index	Percent Factor
0 - 600	100%
600 - 800	90%
800 - 1000	80%
1000 - 1200	70%
1200 - 1600	60%
1600 - up	50%

Source: Federal Register, Vol. 45, No. 251, December, 1980

Analysis

A measure of the effect of financial aid reductions is the change in the percent of student aid to the student's total budget. The budget represents the student's total cost to attend the University. These costs are met by personal and family contributions, as well as with financial aid. Students losing 100 percent of their aid under the Reagan plan would most likely be unaffected if that aid only represented five to ten percent of their total budget. In contrast, students whose budget was entirely supported by aid might be forced to leave school if only 20 percent to 30 percent of their aid were cut.

The students in the study group were aggregated into the following groups based on the percentage change in the amount of the student's total budget funded by financial aid:

1. Group A: Students with less than 20 percent loss in aid.
2. Group B: Students with an aid loss of 20 percent, but less than 30 percent.
3. Group C: Students with a 30 percent or higher loss.

For purposes of the analysis, it was assumed that students in Group C would not recover from the loss in financial support and terminate enrollment at the University. Group B students would be at risk; however, some would recover and some would be lost. Group A students, although affected, would probably be able to recover from the loss in financial support.

Findings

Based upon the assumptions and level of precision of the simulation, the findings are as follows:

1. Of the 3,141 undergraduate students included in the study (11 percent of all undergraduate students), 394 (12.5%) would probably be lost to the University (Group C), 672 students (21.4%) would be at risk (Group B), and 2,075 students (66.1%) would continue (Table 1). Group B and C students together represent 3.8 percent of the undergraduate students attending the University (see Table 1).

2. The ethnic distribution of students in Groups A, B, and C indicate that more students in the Asian Pacific, Hispanic, and Black ethnic groups are at risk (Group B) or estimated not to return to the University (Group C) than American Native and White students in the study group (see Table 2). Of the study group, the American Native, Hispanic, and Black students represented 43 percent, 32 percent, and 24 percent of their ethnic group in the University. This compares to 11 percent and 9 percent for Asian Pacific and White students (see Table 2).

3. The distribution of the students in Groups A, B, and C by residency indicates a larger percentage of Resident students (47 percent) were included in Groups B and C than Non-resident students (30 percent--see Table 3). The loss in student revenues from Group C is $333,400. The student revenues at risk (Group B) are $811,100. The distribution of residency in the study group is the same as the distribution among all undergraduate students.

4. The impact of the Reagan proposal in terms of student gender is even. The proposals do not impact males or females unequally in terms of the estimated impact of the decrease in aid or the number of males and females in the study (see Table 4).

5. The impact of the Reagan proposal on academic level is also evenly distributed within the study group (see Table 5). However, more Freshmen (16 percent) are included in the study group than other academic levels (10 percent Sophomores, 13 percent Juniors, and 9 percent Seniors). This distribution is opposite (except for Sophomores) to the distribution by academic level of the total undergraduate population of the University (20 percent Freshmen, 21 percent Sophomores, 24 percent Juniors, 32 percent Seniors and 3 percent Unclassified).

6. The Colleges most affected by student majors losing financial aid (Groups B and C) were Liberal Arts, Business, and Engineering. However, in terms of all students in the Colleges, the distribution is quite even (between 10-15 percent). The notable exception is the College of Public Programs. Only three percent of the majors in Public Programs were potentially impacted by the Reagan proposal (see Table 6).

7. Of the 35,920 SCH generated by the students in the study group (9.6 percent of all undergraduate SCH), 7,998 SCH was from Group B and 4,420 from Group C. The Colleges most affected were Liberal Arts, Business, Engineering and Education; however, the potential impact to the total SCH of these Colleges from Group B and C students was less than 5 percent (see Table 7).

8. The distribution of cumulative GPA (0.00-1.99, 2.00-2.99, and 3.00-3.99) indicates an even distribution within Groups A, B, and C (see Table 8).

Conclusions and Limitations

Limitations

As indicated above, the purpose of this project was to provide management with timely estimates of the impact of the Reagan plan on colleges and students at ASU until the new financial aid system could provide more definitive analysis. Because of the time constraints and the degree of sophistication in the model, the following limitations should be considered in evaluating the findings:

1. All simulations are estimates of reality. This simulation applied Reagan's proposals to each individual without regard to increasing other forms of aid managed by the institution. In a real situation, the Office of Student Assistance would package aid based on the individual needs of the student using the total resources available to the Office.

2. The simulation does not attempt to reallocate $492,153 discretionary funds "freed" from the 394 Group C students not continuing enrollment at the University. In reality, this money would be used to lessen the impact of the reduction in financial support and "reclaim" some of the students otherwise lost. To this extent, the simulation presents a pessimistic estimate of the impact of the Reagan plan.

3. The simulation is based on Reagan's FY1983 proposals which were announced but never developed into implementing policies or procedures. This simulation is only an estimate of what Reagan's proposals might have been in implementation.

4. The purpose of this type of analysis is to assist management in estimating possible impact on future student enrollment of major changes in student aid programs. A fundamental assumption of the analysis is that the

student characteristics and enrollment patterns in the preceding year are valid in estimating similar patterns in the subsequent year. This assumption may or may not hold for a given year and should be considered in evaluating results of the simulation at any point in time.

5. The decision of whether or not a student will continue his/her education when a reduction in student aid of a certain magnitude occurs is an individual decision. In reality, some students in Group A would not continue their education, while some students in Group C would. The cut-off points established in this study were arbitrary, and probably should be varied depending on optimistic, middle-of-the-road, and pessimistic scenarios of what the impact might be.

Conclusions

The purpose of this paper was to describe an analytical tool simulating the impact of financial aid reductions resulting from the Reagan FY83 proposal. This tool and the approach to the analysis was helpful in developing a timely estimate of the impact on a group of students in the University within the limitations noted above.

The Reagan proposal seems to impact minority groups unevenly at ASU. More Asian Pacific, Hispanic, and Black students were identified as at risk, than American Native and White students. Also, more Resident students were at risk. In terms of impact on Colleges, programs and student credit hours in Liberal Arts, Business, Engineering and Education were most affected. However, the impact on any college in terms of students and SCH in Groups B and C was not significant.

The motivation for continuing to develop this model was eliminated when the Reagan Plan was defeated in Congress. However, the approach taken was

found to be informative, and well within the time and resources available to develop the model. Other institutions without strong systems support may find this approach useful in providing management with estimates of the impact on the institution of changes in financial aid programs.

810/MFA7

Table 1

Percentage Decrease in Financial Aid for Undergraduate Students Based on Reagan's Proposal
Fall 1980

LOST AID AS A % OF BUDGET	GROUP	ORIGINAL AID AS A PERCENT OF BUDGET: Greater than 90%	80%-89%	70%-79%	60%-69%	50-59%	40%-49%	30%-39%	20%-29%	10%-19%	Less than 10%	TOTAL
Less than 10%	A	97	66	87	131	140	189	175	173	142	68	1,268
10%-19%	A	163	94	122	148	115	67	73	18	7	-	807
20%-29%	B	311	147	104	44	29	31	2	4	-	-	672
30%-39%		191	45	22	24	5	2	2	-	-	-	291
40%-49%		56	4	2	0	0	3	-	-	-	-	65
50%-59%		19	2	0	0	0	-	-	-	-	-	21
60%-69%	C	10	0	0	0	-	-	-	-	-	-	10
70%-79%		5	0	0	-	-	-	-	-	-	-	5
80%-89%		1	0	-	-	-	-	-	-	-	-	1
Greater than 90%		1	-	-	-	-	-	-	-	-	-	1
Total		854	358	337	347	289	292	252	195	149	68	3,141

*Student totals for Group A (Less than 10% - 19%): 2,075 Will Return
Group B (20% - 29%): 672 Return Uncertain
Group C (30% - Greater than 90%): 394 Will Not Return
3,141

810bx/MFA9

Table 2

Ethnicity of Students Affected by Financial Aid Reduction
Fall 1980

	AMERICAN NATIVE		ASIAN/PACIFIC		HISPANIC		BLACK		OTHER		TOTAL	
GROUP	Count	%	Count	%	Count	%	Count	%	Count	%	Total	%
A	94	75%	49	60%	249	57%	102	60%	1,581	68%	2,075	66%
B	26	21	20	24	114	26	47	27	465	20	672	21
C	5	4	13	16	74	17	22	13	280	12	394	13
Total	125	100%	82	100%	437	100%	171	100%	2,326	100%	3,141	100%

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810d/MFA9

Table 3

Residency Status of Students Affected by Financial Aid Reduction
Fall 1980

	RESIDENT		NON-RESIDENT		TOTAL	
GROUP*	Count	Percent	Count	Percent	Count	Percent
A	1,390	63%	649	70%	2,039	66%
B	456	21	215	24	671	21
C	339	16	52	6	391	13
	2,185	100%	916	100%	3,101	100%

Number of cases not reported: 40

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810c/MFA9

Table 4

Gender of Students Affected by Financial Aid Reduction
Fall 1980

	MALE		FEMALE		TOTAL	
GROUP*	Count	%	Count	%	Count	%
A	987	65%	1,056	67%	2,043	65%
B	333	22	337	21	670	22
C	196	13	195	12	391	13
Total	1,516	100%	1,588	100%	3,104	100%

Number of cases not reported: 37

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810c/MFA9

Table 5

Academic Level of Students Affected by Financial Aid Reduction
Fall 1980

	FRESHMEN		SOPHOMORES		JUNIORS		SENIORS		TOTAL	
GROUP*	Count	%	Count	%	Count	%	Count	%	Count	%
A	540	66%	419	67%	575	65%	492	66%	2,026	65%
B	174	21	142	22	212	24	139	18	667	22
C	107	13	71	11	93	11	119	16	390	13
Total	821	100%	632	100%	880	100%	750	100%	3,083	100%

Number of cases not reported: 58

*Group defines students' ability t continue college with reduced aid. For explanation, see page 5 of text.

810e/MFA9

Table 6

College of Major of Students Affected by Financial Aid Reduction
Fall 1980

COLLEGE	GROUP A* Count	GROUP A* %	GROUP B* Count	GROUP B* %	GROUP C* Count	GROUP C* %	TOTAL Count	TOTAL %	% OF ALL COLLEGE MAJORS
Architecture	80	4%	23	3%	15	4%	118	4%	12%
Business	552	26	183	27	91	23	826	27	10
Education	110	5	29	4	25	6	164	5	11
Engineering	282	16	108	16	58	15	448	14	10
Fine Arts	121	6	47	7	34	9	202	6	11
Liberal Arts	746	12	246	38	151	39	1,143	36	15
Nursing	95	13	6	1	10	2	111	4	14
Public Programs	49	4	21	3	6	1	76	2	3
Social Work	40	14	9	1	4	1	53	2	14
Total	2,075	100%	672	100%	394	100%	3,141	100%	11%

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810f/MFA9

Table 7

Credit Hour Load on Colleges for Students Affected by Financial Aid Cuts
Fall 1980

COLLEGE	GROUP A* SCH	%	GROUP B* SCH	%	GROUP C* SCH	%	TOTAL SCH	%	% OF COLLEGE SCH
Architecture	122	0%	45	1%	25	1%	192	1	2%
Business	5,458	23	1,745	22	855	19	8,058	22	10
Education	1,975	8	532	7	367	8	2,874	8	14
Engineering	2,530	11	902	11	538	12	3,970	11	11
Fine Arts	712	3	306	4	118	3	1,136	3	4
Liberal Arts	11,850	51	4,154	51	2,345	54	18,349	51	11
Nursing	15	0	0	0	3	0	18	0	0
Public Programs	842	4	314	4	142	3	1,298	4	0
Social Work	24	0	0	0	1	0	25	0	1
Total	23,528	100%	7,998	100%	4,420	100%	35,920	100%	10%

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810a/MFA9

Table 8

Distribution of Cumulative GPA of Students Affected by Financial Aid Reduction
Fall 1980

	0.00 - 1.99		2.00 - 2.99		3.00 - 3.99		TOTAL	
GROUP*	Count	%	Count	%	Count	%	Count	%
A	107	62%	663	62%	600	68%	1,370	64%
B	42	25	263	24	169	19	474	22
C	22	13	152	14	119	13	293	14
Total	171	100%	1,078	100%	888	100%	2,137	100%

Cases not reported: 4. One thousand students of the study group were new to the University and did not have a cumulative grade point.

*Group defines students' ability to continue college with reduced aid. For explanation, see page 5 of text.

810g/MFA9